

Application No. 10/025,718
SD-7063

REMARKS

Claims 1-65 are currently pending.

Claims 1, 23, 37, 44 and 57 are independent claims.

35 USC 103(a) Rejections

The Office rejected Claims 1-65 under 35 USC 103(a) as being unpatentable over US 5,114,595 to Schuster et al. Applicants respectfully submit that **the Office has failed to make a *prima facie* case of obviousness.**

In order to establish a *prima facie* case of obviousness under 35 USC 103(a), three basic criteria must be met by the Office: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all of the claim limitations. See MPEP 2142.

In its first office action, the Office states: *"It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide a water treatment system for removing the concentration of arsenic in water as taught by Schuster et al in order to provide an apparatus for a highly efficient separation of arsenic from water, which is applicable to industrial effluents and which makes it possible to reduce the arsenic to corresponding final concentration values conforming with water safety regulations."*

In order to reject claims 1-65 under 35 USC 103(a) as being obvious in view of Schuster et al, Schuster et al must be modified so that it teaches all of the limitations of claim 1-65. However, nowhere in the first office action (and, in particular, nowhere in the statement above) does the Office identify what modifications the Office would make to Schuster et al in order to teach all of the limitations of claims 1-65. Therefore, the

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Office has failed to make a *prima facie* case of obviousness of claims 1-65, and should withdraw its rejections.

Independent Claims 1, 23, 37, 44 and 57

Applicants wish to **traverse** the statement made by the Office that "Schuster et al disclose...means for separating and removing from the water the magnesium hydroxide with adsorbed arsenic thereby reducing the concentration of arsenic in the water." Applicants submit that *Schuster et al* **do not teach** this process. Rather, *Schuster et al* teach that arsenic contaminants react with a predetermined molar ratio of calcium and magnesium compounds to form low solubility calcium magnesium arsenate precipitates, which are then separated out from the remnant water.

Schuster et al do not teach the step of separating magnesium hydroxide with adsorbed arsenic from the water because *Schuster et al* teach that the arsenic is chemically bound in the form of low solubility calcium magnesium arsenate precipitates. Hence, *Schuster et al* do not teach a "*means for separating and removing from the water the magnesium hydroxide with adsorbed arsenic*", as is recited in independent claims 1, 23, 37, 44 and 57. Since *Schuster et al* do not teach all of the limitations of independent claims 1, 23, 37, 44 and 57, then a *prima facie* case of obviousness cannot be made. Accordingly, the Office should withdraw its rejection under 35 USC 103(a) of claims 1, 23, 37, 44 and 57.

Claims 1-22

Claim 1 recites:

1. A water treatment system for reducing the concentration of arsenic in water below an acceptable level, comprising:

means for adding magnesium hydroxide to the water;

means for adsorbing arsenic on the magnesium hydroxide; and

means for separating and removing from the water the magnesium hydroxide with adsorbed arsenic, thereby reducing the concentration of arsenic in the water to below the acceptable level;

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wherein the magnesium hydroxide has a median particle size less than 3 microns.

Applicants submit that nowhere does *Schuster et al* teach or suggest the use of magnesium hydroxide particles having a median particle size less than 3 microns (as recited in claim 1); or less than 0.5-1 microns (as recited in claim 12), or having a surface area of 7-12 m²/gram (as recited in claim 12).

Since *Schuster et al* do not teach all of the limitations of independent claim 1, then a *prima facie* case of obviousness cannot be made. Accordingly, the Office should withdraw its rejection under 35 USC 103(a) and allow claim 1 and its dependent claims 2-22.

Claims 23-36

In addition to the arguments presented above with respect to independent claim 23, Applicants wish to point out some examples of additional limitations not taught by *Schuster et al*, which are recited in claims 23-26.

As recited in claim 24, *Schuster et al* do not teach or suggest means for continuously separating and removing magnesium hydroxide with adsorbed arsenic comprising dissolved air floatation means, vortex separating means, centrifuging means, magnetic separating means, or combinations thereof.

As recited in claim 29, *Schuster et al* do not teach or suggest that the magnesium hydroxide is disposed on the surface of a carrier particle; or that the carrier particle is lighter than water (claim 30); or that the carrier particle is a plastic or polystyrene microsphere (claim 31); or that the carrier particle is heavier than water (claim 32); or that the carrier particle is a sand particle or a glass microsphere (claim 33); or that the carrier particle is magnetic (claim 34).

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Claims 44-56

In addition to the arguments presented above with respect to independent claim 44, Applicants wish to point out some examples of additional limitations not taught by *Schuster et al*, which are recited in claims 44-56.

As recited in claim 44, *Schuster et al* do not teach or suggest the following limitations:

- (a) means...for continuously converting the magnesium hydroxide with adsorbed arsenic to magnesium carbonate, whereupon free arsenic is released into the aqueous solution;
- (b) means...for continuously separating and removing the magnesium carbonate from the aqueous solution;
- (c) means...for heating the magnesium carbonate to produce carbon dioxide and purified magnesium oxide; and
- (d) means...for providing the purified magnesium oxide to the means for continuously adding magnesium oxide to the water.

As recited in claim 45, *Schuster et al* do not teach or suggest means for contacting the magnesium hydroxide with an aqueous solution comprising a reagent selected from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, and potassium bicarbonate.

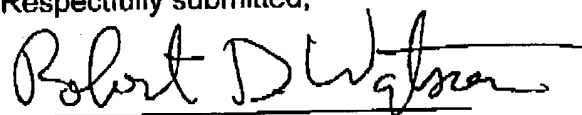
As recited in claim 46, *Schuster et al* do not teach or suggest heating the magnesium carbonate to at least 400 C.

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CONCLUSION

Applicants have responded to each and every objection and rejection, and urge that claims 1-65 as presented are now in condition for allowance. Applicants request expeditious processing to issuance.

Respectfully submitted,



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